

REMARKS

In the Office Action dated January 2, 2002, the examiner removed the prior rejection and issued a new rejection that also included Shimizu '794.

Independent claim 34, the only remaining independent claim, is directed to a light radiating semiconductor component including a semiconductor body that emits blue light and a luminescence conversion element that converts some of the light from the semiconductor device to yellow light to result in white light. Claim 34 also recites that the luminescence conversion element is deposited directly on the semiconductor device and has a substantially uniform thickness.

In paragraphs 2-7 of the Office Action, claim 34 was rejected under various combinations of references, namely:

Paragraph 2-Tadatsu, Shimizu, Abe, Pearce and Cox

Paragraph 3-Tadatsu, Shimizu, Abe, Pearce, Cox and Thornton

Paragraph 4-Tadatsu, Shimizu, Abe, Pearce, Cox and Tokailin

Paragraph 5- Tadatsu, Shimizu, Abe, Pearce, Cox, Tokailin, Mita, Chao and Robbins

Paragraph 6- Tadatsu, Shimizu, Abe, Pearce, Cox and Tokailin and Sato

Paragraph 7- Tadatsu, Shimizu, Abe, Pearce, Cox and Matoba.

Tadatsu JP 5152609 has a gallium nitride semiconductor (with emitting peaks at 430 nm and 370 nm) and a dome-shaped molded resin encapsulation with a fluorescent dye 5 or pigment dispersed in the resin. The resin mold is taller than it is wide, such that there is a longer path for the light through the resin upward than to the sides. Tadatsu thus does not teach substantially equal path lengths, as required by claim 34. Tadatsu also does not specify the color of the converted light, as recited by claim 34.

Shimizu '794 describes a device that includes a blue light LED at one edge of a transparent plate and a luminescent layer on one broad surface of the plate. The luminescent layer converts some of the blue light to yellow. Shimizu '794 does not disclose disposing the luminescent layer directly on the LED, but instead teaches away by its disclosure of a plate to the side of the LED.

Abe U.S. Patent No. 5,535,230 describes a device with a semiconductor laser crystal and fluorescent material. The fluorescent material 4 is coated on the inside of a vacuum tube containing argon gas or the like. Pearce U.S. Patent No. 2,192,869, Cox U.S. Patent No. 2,096,693 and Thornton U.S. Patent No. 3,602,758 also describe fluorescent discharge tubes having thin layers of fluorescent material. In all these devices, the fluorescent material is coated on a tube surface that is spaced from the emitting device by an enclosed region. These devices do not have the electroluminescent material directly deposited on the semiconductor body as recited in claim 34. These references describe devices that are radically different than the much more compact device claimed, which has a uniform thickness directly deposited on the semiconductor body. One skilled in the art would not consider applying the teachings of these references to Tadatsu. Moreover, these references teach away from the claimed invention in that they teach placing a luminescent layer on the inside of a tube that contains an enclosed region. One skilled in the art considering the combined teachings of these references would follow their teachings of providing an enclosed region and spacing the luminescent layer from the light emitter. It is inappropriate to use hindsight reconstruction to pick and choose some teachings of the references to the exclusion of other teachings, using the patent applicant's specification as a guide.

The remaining references do not make up the deficiencies of these references just noted.

Tokailin U.S. Patent No. 5,126,214 describes an electroluminescent element with an organic EL material emitting near UV and a fluorescent material that absorbs UV and emits in visible range from blue to red. Col. 17, lines 34-37 states that "the fluorescent material part must exist outside of both electrodes in the organic EL element part." Common organic EL elements have the structure of thin films comprising electrodes covering the entire main surfaces of the film. Consequently, there is no luminescent conversion element deposited directly on a light creating semiconductor device as required by claim 34.

Mita U.S. Patent No. 3,932,881 describes a device with an IR semiconductor source and a yttrium fluoride luminescent material dispersed in epoxy resin in cavity 33. The patent describes converting the emitted IR to the fullest extent possible. (Col. 3, lines 42-44). This is the opposite of the invention of claim 34, which, as a fundamental part, requires that some of the original light be converted and some not be converted in order to output mixed white light.

Robbins describes photoluminescence of Ce doped YAG and describes use in CRTs and high pressure mercury lamps.

Chao describes luminescence of glasses doped with various materials. Sato describes a full-color fluorescent display device using a variety of fluors. The details of the structure are not described.

Matoba '345 was merely cited against dependent claim 38 for disclosure of a transparent resin over a layer containing a phosphor.

The references, taken alone or in combination, do not disclose or suggest a light emitting component including a semiconductor body that emits blue light, and a luminous conversion element that is directly deposited on the semiconductor body and has a substantially constant thickness, such that some of the blue light is converted to yellow light, and white light is emitted from the device, as required by independent claim 34, as was recognized at the interview on July 9, 2001. The additional reference, Shimizu '794, cited in the January 2, 2002 office action, in point of fact teaches away from the invention, in having an LED at the side of a transparent plate and placing the luminescent layer directly on the semiconductor device, as claimed.

Accordingly, independent claim 34 is allowable under 35 USC 103(a). The remaining claims depend on claim 34 and are allowable with it.

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Applicant asks that all claims be allowed. Enclosed is \$110 check for the Petition for Extension of Time fee. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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